MDHHS
Michigan Department of Health & Human Services
RICK SNYDER, GOVERNOR
NICK LYON, DIRECTOR

ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2009 - 2013)

Bureau of Disease Control, Prevention and Epidemiology
HIV/STD, Body Art, Tuberculosis, and Viral Hepatitis Section, April 2015

Overall trends in new Michigan HIV diagnoses

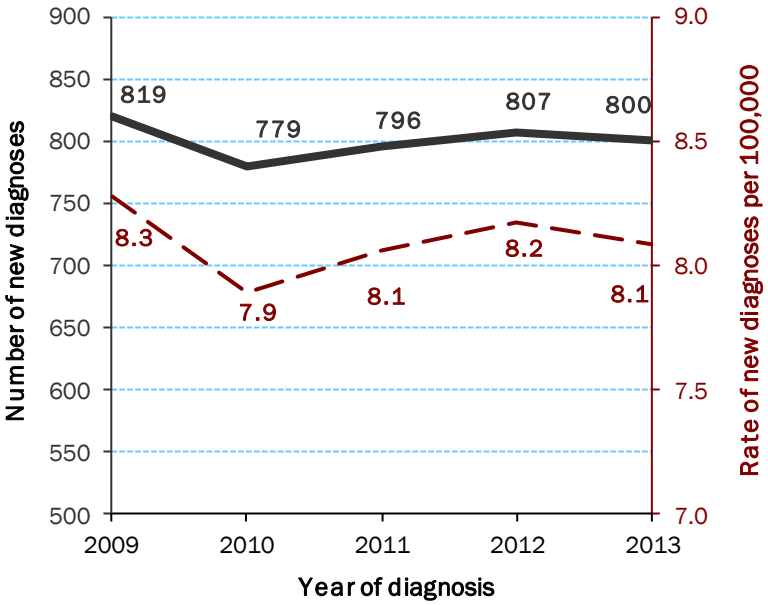
METHODS. To evaluate trends in new HIV diagnoses in Michigan over time, we estimated the number of persons newly diagnosed with HIV infection between 2009 and 2013 by adjusting the number of reported cases to account for those who may not have been reported to the health department by January 1, 2015. These adjustments were made by weighting the data.

Unless otherwise noted, numbers cited include persons living with all stages of HIV infection*. We used regression modeling on the adjusted data to assess significant changes in annual rates of new diagnoses overall and by race, sex, and age. Rates for race and sex subgroups were calculated using intercensal annual population estimates released by the Census Bureau in 2013. Rates for age at diagnosis were calculated using the 2013 Bridged-Race Population Estimates produced by the Population Estimates Program of the U.S. Census Bureau in collaboration with the National Center for Health Statistics. For risk groups, we analyzed annual counts since there are no reliable denominator data available for rate calculation. Trends overall and in subgroups are described using *average annual percent changes* in rates (or counts) of new diagnoses. Only significant trends and their corresponding percent changes are shown. "Significant" indicates statistical significance assessed at $p<0.05$.

For concurrent diagnoses, defined as progression to stage 3 HIV infection within 30 days of HIV diagnosis, we used the Chi Square Mantel-Haenszel test for trend to assess changes over time. This test allows us to assess increases and decreases in the *proportion* of new diagnoses that are concurrent for a particular race/sex combination.

The date of new HIV *diagnosis* does not tell us when persons were first *infected*, because HIV diagnosis may take place months or years after infection. In 2005, the Michigan Department of Health and Human Services (MDHHS) began incidence surveillance, which estimates new *infections* rather than new *diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). In 2013, we released estimated rates of recent infections for 2006-2010. Updated data for more recent years should be released later this year. All STARHS Incidence reports are available on our website.

Figure 1. Number and rate of new HIV diagnoses in Michigan, 2009–2013



KEY FINDINGS

- Rates of new diagnoses in Michigan remained stable overall.
- Increases were noted among white females; decreases occurred for black females.
- New diagnoses remained stable among all risk transmission categories for the 2nd consecutive report.
- Concurrent diagnoses increased overall as well as among males overall, black males, and blacks overall.
- Rates of new diagnoses remained stable among persons living in SE MI and in Out-state Michigan.

*Michigan discontinued use of the term 'AIDS' in January 2012 in accordance with the language in the 2008 HIV Case Definition released by the CDC. HIV infection is now classified by stage of disease, with stage 3 representing AIDS.

OVERVIEW OF TRENDS. Figure 1 shows the number and rate of new HIV diagnoses in Michigan by year for 2009 to 2013. The number and rate of new HIV diagnoses in Michigan remained stable during this time period for the fifth consecutive trend report. There was an average of 801 new cases per year and an average rate of 8.1 cases per 100,000 population.

Each year, there are more new diagnoses of HIV infection than deaths. As a result, the reported number of persons living with HIV in Michigan is increasing. MDHHS estimates that 19,100 persons were living with HIV infection in Michigan as of July 2014.

New HIV diagnoses by age at diagnosis

For the first time, since we began analyzing trends in 2001, the rate of new HIV diagnoses remained stable among persons of all age groups from 2009 to 2013 (table 1).

This is the fourth trend report in eight reports that did not show significant increases in new diagnoses among 13-19 year olds. This is the first of five consecutive reports showing no increases among 20-24 year olds. Almost three quarters of teen and young adult cases combined are residents of Southeast (SE) Michigan. Of these cases, 61% were residents of the City of Detroit at the time of HIV diagnosis.

Though past trend reports showed decreases in rates among 40-44 year olds, rates have remained stable between 2009 and 2013. Before 2005, 35-39 year olds represented one of the highest rates of HIV diagnoses of all age groups. This group now represents the fourth highest rate, with the rates among 20-24, 25-29, and 30-34 year olds surpassing this group. These trends represent a continued shift in the epidemic to younger adults and highlight the large gap between rates among younger persons and older persons.

Of all teens diagnosed in the last five years, 83% are black compared to 61% of persons diagnosed at older ages. Furthermore, teens are much more likely to be black males who have sex with males (MSM) compared to adults 20 years and older (63% vs. 30%, respectively) (figure 2). This underscores a continued need for prevention campaigns tailored to young black MSM, as the rates in this group will likely widen the already large racial gap among persons living with HIV.

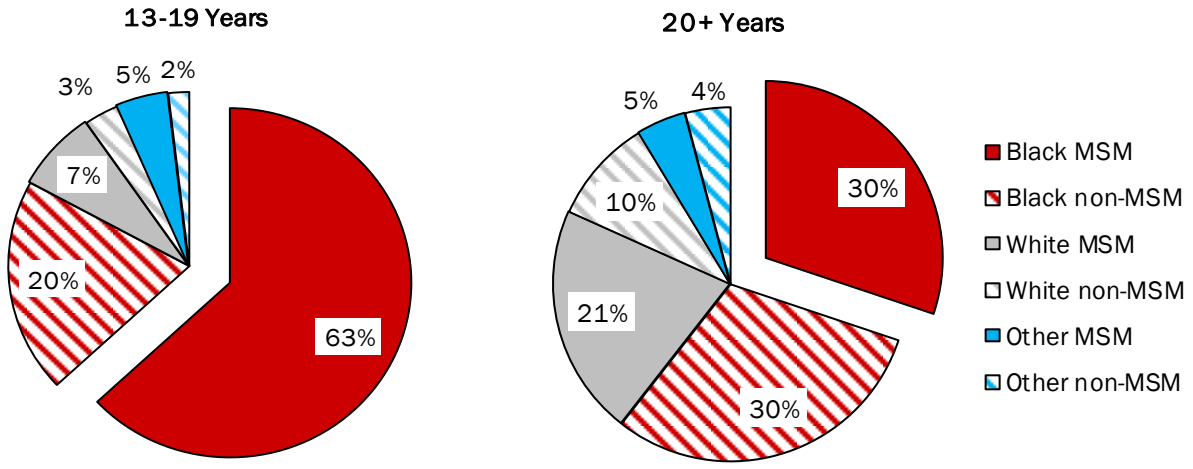
Table 1.‡ New HIV diagnoses by age at diagnosis, 2009-2013

	Year of diagnosis														
Age at	*2009*			*2010*			*2011*			*2012*			*2013*		
diagnosis	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
0 - 12 yrs	4	<1%	0.2	2	<1%	0.1	7	1%	0.4	3	<1%	0.2	1	<1%	0.1
13 -19 yrs	76	9%	7.4	55	7%	5.5	68	9%	6.9	62	8%	6.4	63	8%	6.6
20 -24 yrs	148	18%	22.3	149	19%	22.1	181	23%	26.0	197	24%	27.5	172	21%	23.7
25 -29 yrs	124	15%	20.8	123	16%	20.9	117	15%	20.0	136	17%	23.2	136	17%	22.8
30 -34 yrs	89	11%	15.6	99	13%	17.2	88	11%	15.2	87	11%	14.8	91	11%	15.4
35 -39 yrs	88	11%	13.9	84	11%	13.9	77	10%	13.4	73	9%	12.9	65	8%	11.6
40 -44 yrs	91	11%	13.5	71	9%	10.7	68	9%	10.3	79	10%	12.0	62	8%	9.7
45 -49 yrs	71	9%	9.4	81	10%	11.0	79	10%	11.0	65	8%	9.2	75	9%	11.0
50 -54 yrs	67	8%	8.8	59	8%	7.7	53	7%	7.0	53	7%	7.0	63	8%	8.5
55 -59 yrs	39	5%	5.8	28	4%	4.1	26	3%	3.7	30	4%	4.2	32	4%	4.4
60 and over	22	3%	1.2	27	3%	1.4	30	4%	1.5	24	3%	1.2	40	5%	1.9
Total	**819**	**100%**	**8.3**	**779**	**100%**	**7.9**	**796**	**100%**	**8.1**	**807**	**100%**	**8.2**	**800**	**100%**	**8.1**

‡TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in rates over the 5-year period, while the percentage is the *average change per year* in the rates, as calculated using regression modeling.
- Rates are per 100,000 population.

Figure 2. MSM vs. non-MSM risk by race and age at HIV diagnosis, 2009-2013



New HIV diagnoses by race/sex

The rate of new diagnoses increased among black females for the third time in four trend reports (average 7% per year). The rate among white females increased for the first time (average 12% per year). The rate of new diagnoses remained highest among black persons of both sexes compared to all other race/sex groups. In 2013, the rate among black males was more than 13 times that of white males, and the rate among black females was 14.5 times that of white females. These disparities have persisted since we began analyzing HIV trends in MI, and although decreases in new diagnoses among black females have narrowed the rate difference between black and white females, especially in recent years, the gap between black and white males seems to have remained relatively stable in recent years.

Table 2.‡ New HIV diagnoses by race/sex, 2009-2013

	Year of diagnosis														
	2009			*2010*			*2011*			*2012*			*2013*		
Race/Sex	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
Male	656	80%	13.5	629	81%	13.0	635	80%	13.1	658	81%	13.6	662	83%	13.6
Black	394	48%	59.8	358	46%	54.2	378	47%	57.4	393	49%	59.8	426	53%	65.1
White	213	26%	5.7	218	28%	5.9	200	25%	5.4	209	26%	5.6	182	23%	4.9
Other	49	6%	10.9	53	7%	11.6	57	7%	12.2	57	7%	11.8	54	7%	11.0
Female	163	20%	3.2	150	19%	3.0	162	20%	3.2	149	19%	3.0	138	17%	2.7
Black	128	16%	17.5	113	15%	15.5	111	14%	15.3	104	13%	14.3	93	12%	12.8 ↓ 7%
White	21	3%	0.5	23	3%	0.6	31	4%	0.8	31	4%	0.8	34	4%	0.9 ↑ 12%
Other	14	2%	3.1	14	2%	3.0	19	2%	4.0	14	2%	2.9	11	1%	2.3
All	819	100%	8.3	779	100%	7.9	796	100%	8.1	807	100%	8.2	800	100%	8.1
Black	522	64%	37.6	471	60%	33.9	489	61%	35.3	497	62%	35.9	519	65%	37.6
White	234	29%	3.1	241	31%	3.2	231	29%	3.1	240	30%	3.2	215	27%	2.9
Other	63	8%	7.0	67	9%	7.3	76	10%	8.1	71	9%	7.3	65	8%	6.6

‡TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in rates over the 5-year period, while the percentage is the *average change per year* in the rates, as calculated using regression modeling.
- Rates are per 100,000 population.

New HIV diagnoses by risk

Between 2008 and 2012, the number of newly diagnosed persons did not increase or decrease significantly for any risk transmission group. Like last year, there was no decrease among IDU which has been noted in all previous reports since we began analyzing trends in MI. This is also the second trend report not to reflect decreases among heterosexuals in the past six reports.

The "other known" risk category includes perinatal and blood product transmission. The numbers have been low in this group for many years owing to programmatic successes in preventing perinatal and blood-borne transmissions.

New diagnoses among persons with no identified risk (NIR) remained stable between 2009 and 2013. Though stable, there is a targeted effort to reduce the number of new diagnoses with NIR. Risk information is important information for prevention efforts; thus, it is crucial that risk questions be answered on the adult case report form (ACRF). Protocols are currently in place to achieve better risk ascertainment.

Table 3.‡ New HIV diagnoses by risk, 2009-2013

	Year of diagnosis									
	2009		2010		2011		2012		2013	
Risk	Num	%	Num	%	Num	%	Num	%	Num	%
MSM	446	54%	439	56%	447	56%	459	57%	435	54%
IDU	27	3%	35	5%	27	3%	27	3%	34	4%
MSM/IDU	16	2%	7	1%	14	2%	12	1%	12	2%
Heterosexual	156	19%	138	18%	136	17%	128	16%	134	17%
Other known	3	<1%	2	<1%	7	1%	3	<1%	4	1%
No identified risk	171	21%	158	20%	166	21%	178	22%	181	23%
Total	819	100%	779	100%	796	100%	807	100%	800	100%

‡TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in number of new diagnoses over the 5-year period, while the percentage is the *average change per year* in the the number of new diagnoses, as calculated using regression modeling.
- The heterosexual category includes males whose female sexual partners are known to be HIV-infected or at high risk for HIV and females who reported sex with males regardless of what is known about their partners' HIV status or risk. The NIR category includes males who reported sex with females of unknown risk/HIV status as their only risk and males and females for whom no risk has yet been reported.

Figure 3. Race among MSM, 2009-2013

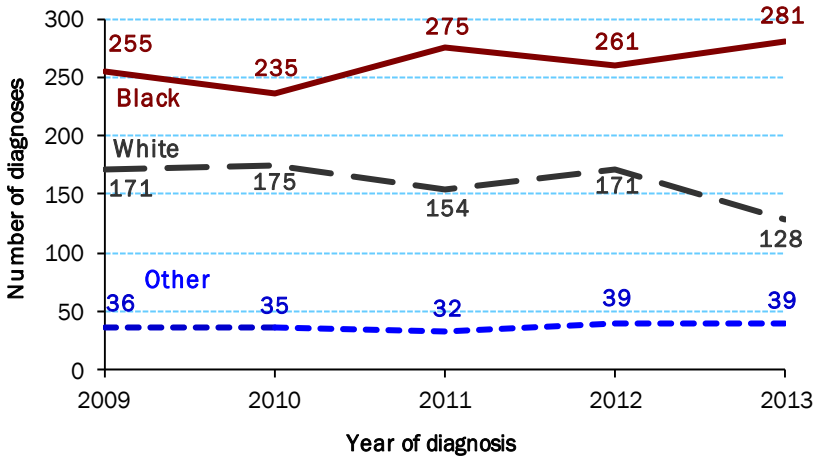


Figure 3 illustrates trends among MSM by race. MSM were more than half of all new diagnoses between 2009 and 2013 (56%). Of these newly diagnosed MSM, 57% are black. The number of white MSM cases decreased significantly between 2009 and 2013. Though there was no significant increase in the number of black MSM cases as has been seen in past reports, black males continue to make up the largest proportion of all MSM HIV cases in Michigan.

Concurrent diagnoses

The proportion of persons diagnosed with stage 3 HIV infection within 30 days of diagnosis (concurrent diagnoses) increased significantly overall from 19% to 26% between 2009 and 2013 (table 4). Similarly there were significant increases in the proportion of concurrent diagnoses among all males as well as black males. The proportion increased in blacks overall, most likely due to increases among black males (who made up 78% of black diagnoses between 2009 and 2013). This is the first time there have been increases in concurrent diagnoses overall as well as

(Continued on page 5)

(Continued from page 4)

Concurrent diagnoses (cont.)

among any race/sex groups since we began analyzing trends in MI. Men had a significantly higher proportion of concurrent diagnoses than women, and persons of black race had significantly fewer concurrent diagnoses than persons of all other races (19% vs. 25%, respectively). Many concurrent diagnoses represent a failure to diagnose HIV early in the course of the infection and/or a failure to initiate early treatment. Persons who are unaware of their HIV infection cannot benefit from early antiretroviral therapy and have a poorer prognosis than those diagnosed earlier in the disease course. They are also not accessible for primary prevention (transmission to uninfected individuals). Expanding routine HIV testing in medical settings and provision of HIV testing at community-based and outreach settings will promote and facilitate access to HIV testing, which may improve health outcomes for those who are infected.

Table 4.‡ Concurrent HIV diagnoses by race/sex, 2009-2013

	Year of diagnosis												
	2009		2010		2011		2012		2013		Total		
Race/Sex	Num	%	Num	%	Num	%	Num	%	Num	%	Num	%	
Male	129	20%	149	24%	116	18%	135	20%	179	27%	708	22%	↑7%
Black	70	18%	77	22%	57	15%	65	17%	105	25%	374	19%	↑7%
White	47	22%	61	28%	52	26%	57	27%	56	31%	273	27%	
Other	12	24%	11	21%	7	12%	12	21%	18	34%	60	22%	
Female	26	16%	24	16%	34	21%	26	17%	30	21%	140	18%	
Black	22	17%	19	17%	22	20%	20	19%	20	22%	104	19%	
White	4	19%	3	13%	5	16%	2	6%	8	24%	22	16%	
Other	0	0%	2	14%	7	37%	4	29%	1	9%	14	19%	
All	155	19%	173	22%	150	19%	161	20%	209	26%	848	21%	↑7%
Black	92	18%	96	20%	79	16%	85	17%	125	24%	478	19%	↑6%
White	51	22%	64	27%	57	25%	59	25%	64	30%	296	25%	
Other	12	19%	13	19%	14	18%	16	23%	19	30%	75	22%	

‡TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- Percentages reflect the number of concurrent diagnoses for a race/sex/year combination divided by the total diagnoses for that race/sex/year combination.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. Significance was assessed using the Mantel-Haenszel chi-square test. The arrow indicates the direction of change while the accompanying percentage is the *change in proportion of concurrent diagnoses* from 2009 to 2013, which do not take into account the fluctuations from year to year.

New HIV diagnoses by residence at diagnosis

The rate of new HIV diagnoses remained relatively stable in Southeast Michigan (Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne counties), as well as the rest of the state between 2009 and 2013 (table 5). It is also important to note that the burden of new diagnoses continues to disproportionately affect Southeast Michigan (SE MI).

Table 5.‡ New HIV diagnoses by residence at diagnosis, 2009-2013

	Year of diagnosis														
	2009			2010			2011			2012			2013		
Residence	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
SE MI	557	69%	13.0	539	70%	12.6	536	68%	12.6	556	69%	13.1	534	67%	12.5
Out-state	247	31%	4.7	233	30%	4.2	253	32%	4.5	248	31%	4.4	263	33%	4.7
Prison or Unknown	15	2%	N/A	7	1%	N/A	7	1%	N/A	3	0%	N/A	4	1%	N/A
Total*	**804**	**100%**	**8.3**	**772**	**100%**	**7.9**	**789**	**100%**	**8.1**	**804**	**100%**	**8.2**	**796**	**100%**	**8.1**

‡TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- Rates are per 100,000 population.

Summary

- The number and rate of new HIV diagnoses in Michigan remained stable between 2009 and 2013 for the 5th consecutive trend report, with an average of 801 new cases per year and an average rate of 8.1.
- The highest rates of new HIV diagnoses occurred among:
  - 20 - 24 and 25-29 year olds
  - Black males and females
  - Men who have sex with men (MSM)*
  - SE MI residents
- INCREASES in rates occurred among:
  - White females
- DECREASES in rates occurred among:
  - Black females
- Very few significant changes were found among the various subgroups analyzed, suggesting that new diagnoses overall are becoming increasingly stable each year.
- Almost three quarters of Michigan's new cases among 13 - 24 year olds were residents of SE MI at diagnosis. Of these SE MI young adults, 61% lived in the City of Detroit.
- 82% of new 13 - 19 year old cases are black (of whom 74% are MSM), whereas 59% of those aged 20 and older are black. This finding suggests that black teens and young adults in general, and young black MSM in particular, should continue to be the focus of aggressive prevention activities.
- Race and sex disparities in rates of new HIV diagnoses remain. Comparing the diagnosis rates of black persons and white persons in 2013:
  - **Overall:** The rate for black persons was over 13 times higher
  - **Males:** The rate for black males was over 13 times higher
  - **Females:** The rate for black females was over 14 times higher
- Increases in concurrent diagnoses occurred overall as well as among males overall, black males, and blacks overall. This is the first report to ever show increases in concurrent diagnoses in any race/sex group suggesting a need for increased efforts toward improving early case detection.

*Annual counts were analyzed for risk groups since there are no reliable denominator data available for rate calculation.

For more information:

Michigan Department of Health and Human Services
HIV Surveillance Program
(248) 424-7910
(517) 335-8165
(**www.michigan.gov/hivstd** —> Statistics and Reports)
State of Michigan HIV Statistics and Reports

Michigan Department of Health and Human Services
HIV Prevention and Care Section
(517) 241-5900
(**www.michigan.gov/hivstd**)
State of Michigan HIV/AIDS Programmatic Information

MI Counseling, Testing, & Referral Sites
http://www.aidspartnership.org/index.php/testing-and-locations/

Michigan AIDS Hotline
1-800-872-2437

Centers for Disease Control & Prevention
http://www.cdc.gov/hiv
CDC HIV/AIDS Resources

AIDSInfo
http://www.aidsinfo.nih.gov/
HIV/AIDS Treatment and Clinical Trial Resources

CDC National Statistics & Surveillance
http://www.cdc.gov/hiv/statistics/
CDC HIV/AIDS Statistics and Reports

World Health Organization
http://www.who.int/topics/hiv_infections/en/
HIV/AIDS Global Resources